

PATENT

Attorney Docket No.: AMAT/8303/CMP/ECP/RKK

Express Mail No.: EV335470820US

**What is claimed is:**

1. A fluid delivery system for a multiple chemistry electrochemical plating platform, comprising:

a solution mixing system fluidly communicating with a fluid distribution manifold;

a catholyte supply conduit in fluid communication with the manifold and selectively in fluid communication with a plurality of catholyte fluid solution tanks;

an anolyte supply conduit in fluid communication with the manifold and selectively in fluid communication with a plurality of anolyte fluid solution tanks; and

a selectively actuated valve positioned adjacent each of the anolyte and catholyte tanks in the supply conduits.

2. The fluid delivery system of claim 1, wherein the solution mixing system comprises:

a fluid metering pump having a plurality of fluid inputs and at least one fluid output in fluid communication with the manifold;

a base solution container in fluid communication with one of the plurality of inputs;

a plurality of additive containers, each of the plurality of additive containers being in fluid communication with at least one of the inputs; and

a controller in communication with the fluid metering pump, the controller being configured to operate the metering pump such that the base solution and fluid from the plurality of additive containers is mixed in a predetermined ratio and dispensed from one of the at least one outputs.

3. The fluid delivery system of claim 1, further comprising a fluid connection positioned between the selectively actuated valve and each of the tanks, the fluid connection being positioned to drain into the respective tank when the valve is in a closed position.

PATENT

Attorney Docket No.: AMAT/8303/CMP/ECP/RKK

Express Mail No.: EV335470820US

4. The fluid delivery system of claim 1, wherein each of the individual anolyte tank and catholyte tank pairs are in fluid communication with an individual plating cell.
5. The fluid delivery system of claim 4, wherein each of the anolyte and catholyte tanks comprise a fluid baffle system positioned in an interior of the tanks.
6. The fluid delivery system of claim 5, wherein the baffle system comprises:
  - at least two compartments, the at least two compartments being separated by at least one wall;
  - a fluid feed through positioned in a lower portion of the wall; and
  - at least one angled wall positioned in a fluid flow path within each of the at least two compartments.
7. The fluid delivery system of claim 5, further comprising an angled fluid receiving wall positioned to receive fluid supplied to the individual fluid tanks.
8. The fluid delivery system of claim 1, further comprising a degasser positioned in the catholyte supply conduit.
9. A plating solution mixing and delivery system for an electrochemical plating platform, comprising:
  - a fluid mixing apparatus, comprising:
    - a fluid metering pump having a plurality of inputs and at least one output;
    - base solution container in fluid communication with one of the plurality of inputs;
    - a plurality of additive containers, each of the plurality of additive containers being in fluid communication with at least one of the inputs;
    - and

PATENT

Attorney Docket No.: AMAT/8303/CMP/ECP/RKK

Express Mail No.: EV335470820US

a controller in communication with the fluid metering pump, the controller being configured to operate the metering pump such that the base solution and fluid from the plurality of additive containers is mixed in predetermined ratios and dispensed from one of the at least one outputs;  
a fluid dispensing manifold in fluid communication with the at least one output;

an anolyte conduit in fluid communication with the manifold, the anolyte conduit fluidly communicating with an anolyte storage tank;

a catholyte conduit in fluid communication with the mixing manifold, the catholyte conduit fluidly communicating with a catholyte storage tank; and

an electrochemical plating cell having an anolyte compartment and a catholyte compartment, the anolyte compartment being in fluid communication with the anolyte storage tank and the catholyte compartment being in fluid communication with the catholyte storage tank.

10. The system of claim 9, wherein the at least one catholyte tank comprises a six sided fluid containing tank having at least one slanted fluid receiving side.

11. The system of claim 10, wherein the at least one catholyte tank comprises a fluid return line positioned to dispense circulated catholyte onto an interior surface of the slanted fluid receiving side.

12. The system of claim 11, wherein the at least one catholyte tank comprises a baffle system positioned in an interior of the tank.

13. The system of claim 12, wherein the baffle system comprises:

a plurality of baffle walls that cooperatively form a plurality of fluidly isolated compartments; and

a plurality of fluid pass throughs positioned on a lower portion of the plurality of baffle walls, the plurality of fluid pass throughs operating to allow fluid to travel from one isolated compartment to an adjacent isolated compartment.

PATENT

Attorney Docket No.: AMAT/8303/CMP/ECP/RKK

Express Mail No.: EV335470820US

14. The system of claim 13, wherein each of the isolated compartments includes an angled fluid engaging wall positioned in a fluid path therein.

15. The system of claim 9, wherein the anolyte tank comprises a plurality of isolated fluid chambers separated by baffle walls having fluid pass throughs positioned on a lower portion thereof.

16. The system of claim 15, comprising a fluid purge valve positioned adjacent each of the anolyte and catholyte tanks in the respective anolyte and catholyte conduits.

17. The system of claim 15, wherein the fluid purge valve is in communication with the controller and is configured to drain the catholyte conduit and the anolyte conduit once a desired chemistry is delivered to the respective anolyte or catholyte tank.

18. A plating solution mixing and delivery system for a multi-chemistry electrochemical plating system, comprising:

- a plating solution mixing assembly positioned onboard the multi-chemistry electrochemical plating system;

- at least one catholyte solution tank and at least one anolyte solution tank, each of the anolyte solution tank and the catholyte solution tank being in fluid communication with the plating solution mixing assembly;

- a fluid bubble baffle assembly positioned inside the catholyte solution tank; and

- a supply line purge valve positioned adjacent each of the catholyte solution tank and the anolyte solution tank in fluid communication with fluid supply return line for the respective tanks, the supply line purge valve being configured to drain fluid from the supply return line after a fluid solution has been delivered to the tank.

19. The system of claim 18, wherein the fluid baffle assembly comprises:

PATENT

Attorney Docket No.: AMAT/8303/CMP/ECP/RKK

Express Mail No.: EV335470820US

a plurality of upstanding walls that cooperatively form isolated fluid chambers therebetween;

a plurality of fluid pass throughs positioned at a lower base of the upstanding walls, the positioning of the fluid pass throughs being configured to generate a serial fluid path through all of the isolated fluid chambers; and

a plurality of angled baffle walls positioned in a fluid path of each of the isolated chambers.

20. The system of claim 19, wherein the catholyte solution tank includes a tilted wall configured to receive recirculated catholyte solution thereon and flow the catholyte solution downward towards the bottom of the catholyte solution tank while maintaining the flowing catholyte solution on a tilted surface of the wall.

21. The system of claim 18, wherein the plating solution mixing assembly comprises:

a fluid metering pump having a plurality inputs and at least one output;

a virgin plating solution source in fluid communication with one of the plurality of inputs;

a plurality of additive sources in fluid communication with individual inputs of the fluid metering pump; and

a metering pump controller configured to operate the metering pump such that the virgin plating solution is mixed with the additive sources in a predetermined ratio and dispensed from the output of the metering pump to the catholyte tank or the anolyte tank.